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ABSTRACT

In its first year, an interdisciplinary recreational aquatics program serving eight deaf blind children (3 to 18 years old) developed and sequenced individualized objectives for communication, social, and gross motor areas. Inservice training was conducted for 13 nonhandicapped high school students serving as peer tutors, who were then evaluated according to 12 performance indices. Parents received scrapbooks with information and pictures of their child. The water has proved to be a feasible environment for deaf blind children, institutional staff have noted a decrease in student inappropriate behaviors, and peer tutors have exhibited competence and a sense of responsibility toward the program. (CL)

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THE WATER AS A LEARNING ENVIRONMENT:
A MODEL FOR INTEGRATING LEISURE TIME ACTIVITIES AND EDUCATION
FOR DEAF-BLIND YOUNGSTERS

by Marie Thompson

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Background

This after-school program uses a recreational setting, a swimming pool, to facilitate the learning of severely impaired deaf-blind children and to increase their opportunities to interact positively within their communities. The rationale for selecting this setting is that activities developed through leisure programs can increase the youngsters' social and communicative interaction and improve their gross motor control. Additionally, such activities can provide deaf-blind children opportunities to interact with non-handicapped people.

Several statements made at the BEH-sponsored National Institute on Program Development and Training in Recreation for Deaf-Blind Children, Youth and Adults support the decision to select recreational programming as the core of this project: ". . . the opportunity that recreation affords individuals to share experiences with others, thereby developing interpersonal skills, is relevant to emotional, social and prevocational need areas," "recreation offers a major means for promoting 'mainstreaming' of the Deaf-Blind with their normal peers," "recreation activities become the realistic 'testing ground' for many areas of skill development," and "there is a special need for bringing the fields of specialized education and recreation together" (Brannon, English, and Bettica, 1974).

Despite the recognized value of coordinating classroom and leisure time activities, there has been little attention given to actually developing such leisure programs for the deaf-blind. Such a lack could be attributed to the facts that 1) these children need an inordinate amount of training in other areas; 2) there is little documentation of children's skill development when leisure time activities are taught; or 3) the funds provided for educating

deaf-blind children can be stretched only so far and the dollars are spent on what is considered bedrock necessity, i.e., a basic educational program. Our position is that recreational activities in fact have important educational outcomes.

It is possible that more administrators in educational, social services, or recreational programs would allocate funds for recreational activities of deaf-blind persons if they could see results demonstrating progress in several related areas, such as improved physical and communication functions. Our project staff hope that, with proof of the educational effectiveness of these activities, more people will be interested in providing deaf-blind youngsters with the full, comprehensive programs that are provided for nonhandicapped students and which lead to an enriched life beyond school and greater opportunities for integration.

In order to assess the deaf-blind children in our project and to develop the programs for them, it has been essential for the project's personnel, who represent several professional disciplines, to work as an interdisciplinary team. This team has also shared responsibilities for developing inservice training modules and providing the training to others who work with the deaf-blind children on a daily basis such as Foster Grandparents, residential hall staff, and peer tutors. The peer tutors are high school students who, following training, work with the deaf-blind students each day in the locker room, swimming pool, and gym and teach the small-step programs that lead to attainment of instructional objectives. They have proven to be excellent teachers for this group of children.

Water as the Instructional Environment

The swimming pool was chosen as the primary instructional setting for improving the skills of the deaf-blind children for four reasons. First, I had noticed during many years of working with deaf-blind children that they were remarkably different in the water than they were on land: their muscles and bodies appeared more relaxed, there was increased vocalization, and the children appeared more content. Second, the 95^{0} F water provides a secure and relaxing environment for the children, who are far more receptive to learning the targeted skills in the water than in the conventional classroom setting. Third, the community swimming pool provides the children with increased opportunities for contact with citizens outside of the institutional setting for recreational purposes. Fourth, since community pools are accessible all over the United States, the project is easily replicable. The goal of the project is to teach specific skills in the swimming pool, which can then be generalized to progressively broad environments, such as the locker room, gymnasium, classroom, residential units, and eventually the surrounding community.

Population

Criteria for selecting the project's children were as follows: Deaf-blind children were selected who 1) were being educated in close geographic proximity to nonhandicapped children so the two groups could be integrated; 2) had access to recreational facilities in order that programs could be developed above and beyond basic educational needs; 3) were already being served in an educational program to meet their individual needs; 4) were being served in a school district that wished to participate in the project in order to develop expanded opportunities for deaf-blind children; and 5) were

enrolled in an educational program geographically close to the University of Washington. The fifth criterion was important in order to establish and maintain close cooperation between the University and school district and to utilize the project site for graduate student training.

In order to comply with these criteria, eight deaf-blind children and youth who were enrolled in educational programs within the Shoreline School District were selected as the target population. All but one of these children live at Fircrest School, an Intermediate Care Facility for the Mentally Retarded run by the Washington State Department of Social and Health Services and located within the Shoreline School District, which is responsible for their basic educational program. When the children were first enrolled in the project, their chronological ages ranged from 3 to 18 years and their functional ages ranged from 1 month to 2 years.

The University of Washington's Integrated Educational/Leisure Time Program for Deaf-Blind Children and Youth

The project is now in its second year of operation. This paper will discuss the first year's activities. The program is composed of numerous parts, several that deal directly with child progress objectives and measurement, several that involve developing new training materials and using these materials to train different groups to work with the deaf-blind students, and a parent involvement component.

Target Population Activities

Assessment. Before beginning the water program, all children were assessed by the professional team in three areas, communication, social, and gross motor skills, with the Callier-Azusa Test for Deaf-Blind Children (Stillman, 1978), The Gestural Approach to Thought and Expression (GATE) (Langley, 1979), the motor portion of the Bayley Scales of Infant Development (Bayley, 1969), and the Deaf-Blind Motor Assessment Tool (Harris, 1981). After the children had participated in the water program for 6 months they were measured again with the same tools. Additionally, daily data were taken on all objectives for each child and graphed weekly in order to chart progress and permit the staff to implement changes in objectives as necessary (see Figure 1).

Insert Figure 1 here

Objectives. Following initial assessment, two objectives each in the communication, social, and gross motor areas were written for each child. Each objective was broken out into small steps, commensurate with these severely impaired children's rate of learning (see Figure 2 for sample objective and small steps).

Figure 1

Student's Name Ray [redacted]

Objective GM 4.1

Ray will jump down off bench (pool bench or hallway bench) with feet together 2 out of 3 trials on 5 consecutive data days.

Criterion

Location Pool

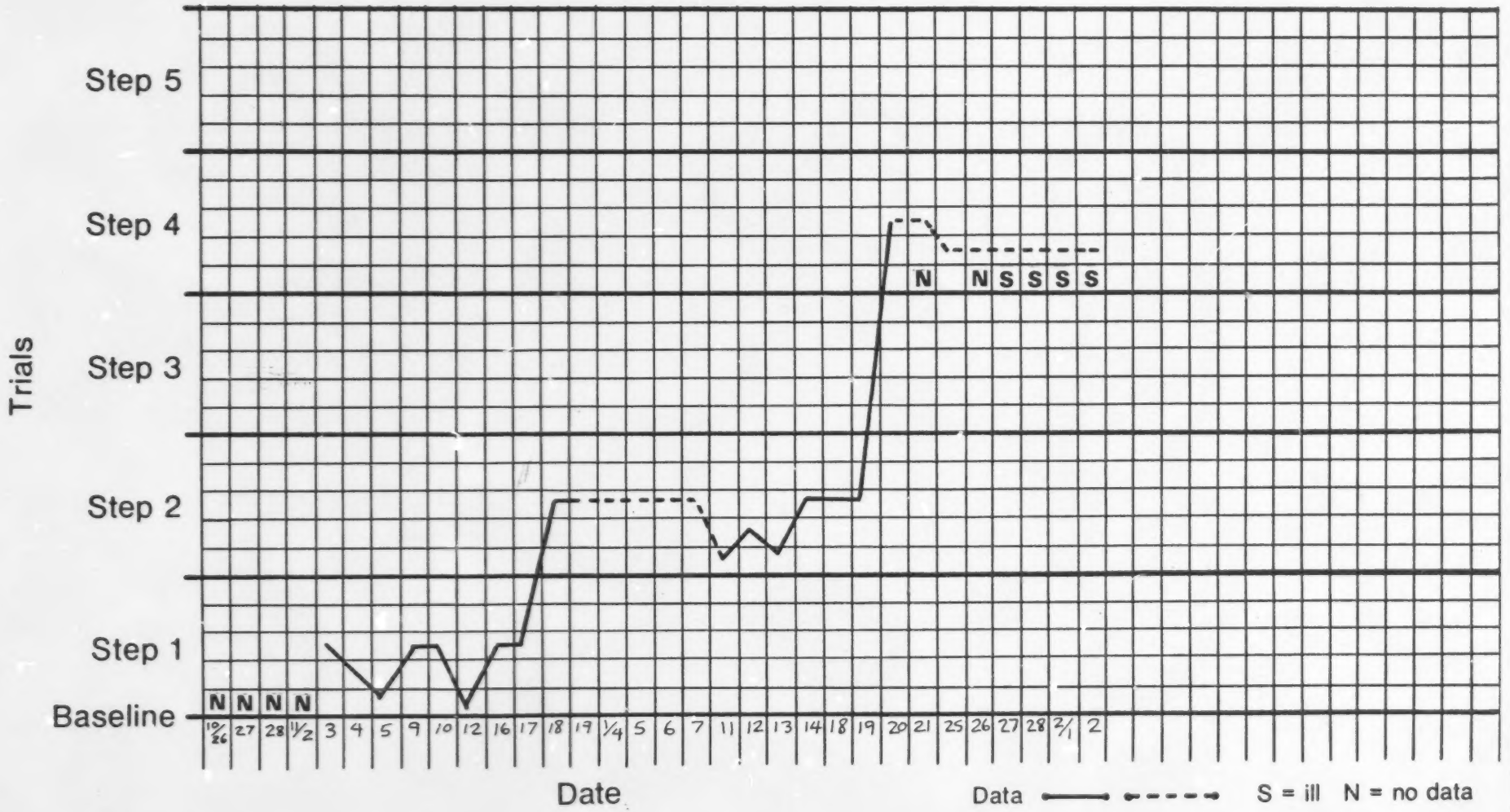


Figure 1

Figure 2

SAMPLE OF A SOCIAL OBJECTIVE AND SMALL STEPS FOR PROGRAMS

Social Goal 4: To increase interaction with peer.

Objective 4.1: When placed together on the tube in the water, David and Ray will hold hands with verbal/signed cue for 60 seconds for 4/5 trials over 15 consecutive days.

Step 1: Tutor gives sign/verbal for "hold hands, David (Ray)."
Place David and Ray's hands together.
Each tutor holds hands in position to insure hand holding (full motor assist).
Criterion: Keep hands in place for 5 seconds 4/5 trials for 3 days - go to step 2.
Consequence: + If David (Ray) permit activity without pulling, biting, etc. - rub heads and praise verbally.
- If David (Ray) resist, pull out of water and ignore.

Step 2: Repeat step 1 but increase to 10 seconds.

Step 3: Tutor gives sign/verbal for "hold hands, David (Ray)."
Place hands together.
Tutor places fingers lightly on David's (Ray's) hands (partial assist).
Criterion: Hands remain in place for 5 seconds 4/5 trials for 5 consecutive days, go to step 4.
Consequence: + David (Ray) hold for 5 seconds praise, rub head, etc.
- David (Ray) resist: return to step 1.

Step 4: Repeat step 3: Increase to 10 seconds.

Step 5: Tutor gives sign/verbal for "hold hands, David (Ray)."
Places hands together, then no assist.
Criterion: David (Ray) hold hands for 2 seconds 4/5 trials for 3 consecutive days, go to step 6.
Consequence: + David (Ray) hold hands: praise, rub head, etc.
- David (Ray) do not hold hands - return to step 3.

Step 6: Repeat step 5: Increase amount of time as follows:

to	5	seconds	4/5	trials	for 2	consecutive days
	10	"	"	"	2	" "
	20	"	"	"	2	" "
	40	"	"	"	2	" "
	60	"	"	"	15	" "

+ praise, rub head, play with by swirling tube, etc.
- return to fewer seconds required if, at 5 seconds, there are 3 - return to step 3.

Selection of the objectives was based upon initial assessment results, ease of teaching the skills in the water, and ease of tranferring or generalizing these skills to other environments such as the gym, living hall, and classroom. During the first year, deaf-blind children worked on meeting these objectives in the water program 4 days per week after school from 3:00 to 5:00 for 6 months. The fifth day of each week was spent in the gym, where first efforts were made to transfer pool objectives to a "land" environment.

Training

Inservice training modules were developed by the project staff in the areas of water safety, behavior management, data collection, gross motor development, social skills, and communication skills. The inservice training included both didactic information presented in a classroom setting and "hands on" training in the locker room and swimming pool 2 hours per day, 4 days per week, for 3 weeks. The initial target group for training included 13 nonhandicapped high school students (peer tutors) who would provide individual instruction and work on objectives with the deaf-blind children. Pre- and post-test data for the initial training are found in Table 1, which shows the means for peer tutors' inservice training results.

Table 1

Pre- and Post-test Results of Inservice Training for Peer Tutors

Area Taught	Pre-test mean percent	Post-test mean percent
Communication Skills	20.37	90.72
Water Safety	13	93
Behavior Management	1	88
Data Collection	36.25	87.5
Gross Motor Skills	46	85
Social Skills	8.3	92

The week when the deaf-blind children were first introduced to the water program was also a training time for the peer tutors, who until then had had "hands on" experience with the children only on land. After the intensive initial training, ongoing inservice sessions occurred each Friday from January through June. The training was provided after the day's work with the children and included review of previously presented materials, review of each child's folder, answers to questions about specific children, and discussions about appropriate handling and interaction with the deaf-blind children. Several sessions included reviewing videotapes and slides of the peer tutors working with their assigned students.

Peer tutor evaluation. Peer tutors were evaluated on their performance twice during the pilot year of the program. Three project staff members rated each tutor on 12 items (see Table 2, "Evaluation of Peer Tutor Performance"). The scores from all three were tallied and a mean score was derived. The evaluations were discussed with the tutors at individual conferences.

Comparison of mean scores from the two evaluation periods shows that, as a group, the tutors improved in all but two areas, "maintaining positive attitude" and "work attendance." This finding corresponds to the project staff's general impression of peer tutor "burn-out" in the late spring. Absenteeism was especially high during high school graduation time when there were frequent rehearsals, ceremonies, and parties.

Table 2

Evaluation of Peer Tutor Performance

(9 points possible for each item)

	Mean Scores (Based on input from three professional staff members)	
	April	June
1. Conducts child's objective activities accurately and efficiently	8.4	8.5
2. Uses timely and appropriate reinforcement.	8.4	8.4
3. Uses spare time with child constructively.	7.5	8.2
4. Shows creativity and initiative in suggesting appropriate alternative activities for child when needed.	7.4	7.6
5. Accepts responsibility for child in the day-to-day routine of the program.	8.5	8.6
6. Shows patience and initiative in dealing with unexpected problems.	8.0	8.3
7. Complies cheerfully with instructions or suggestions given by project staff members.	8.6	8.7
8. Collects data accurately and efficiently.	8.5	8.6
9. Maintains a positive attitude.	8.6	8.3
10. Is not easily distracted by events unrelated to child's needs.	7.5	8.5
11. Does not arrive late or leave early.	8.4	8.5
12. Is present at work regularly.	7.0	6.9

Parent Involvement

All parents of project children were invited to an initial meeting in February, and six parents of three children participated. The project staff explained the program's goals and expressed the desire to assist the parents in any way possible. The parents who attended the meeting were very enthusiastic about their children's particination but did not wish to be involved directly. Parents who did not attend lived at a great distance from the project site.

The staff had developed a needs assessment survey, which was given to the parents who attended the meeting and sent to those who did not. All assessment forms were returned, but two sets of parents wrote on their forms that they did not wish to respond. Of the six sets who responded, their major request for assistance was simply for information once or twice a year from a staff member (either in person or in a letter) regarding their child's progress.

These parents had been heavily involved with their profoundly impaired children for so long that they were apparently experiencing a type of burn-out. Although they were very interested in their children's welfare, they did not want to be actively involved in the project on a regular basis. In order to provide information but not demand involvement the project staff sent all parents pictures of their child participating in project objectives, as well as copies of newspaper articles about the project and a letter describing the year's activities. At the end of the first year, therefore, all parents had a scrapbook with information about their child and pictures. Pictures and new information are sent on a regular basis so that parents are kept informed.

Results

The results cover the first 6 months of the water program. These include unanticipated results which we believe will benefit both the deaf-blind participants as well as other severely impaired children, child gains in the three skill areas addressed within the project, and change in attitude of the peer tutors. Although the data cover only a portion of the pilot year of the project and therefore are limited and cannot be construed to have far reaching implications, results do suggest that, thus far, the program has been a success and could benefit other handicapped children.

Unanticipated Results

During their spring vacation, when they were not scheduled to work in the project, peer tutors visited the project children at Fircrest. Five of the peer tutors became so interested in handicapped students that they signed up to work at the Prader-Willi Srydrome Summer Camp during their summer break. One student selected the subject of deaf-blindness to study for a special project in school. She wrote a paper and presented the information to a class of 28 high school students who, prior to the presentation, knew nothing about deaf-blindness or deaf-blind children. One of the peer tutors volunteered to work in the children's classroom 5 mornings a week during spring quarter. She did this as part of a project for school and the information she gained was shared with others in her high school. The project was visited by many members of the community, as well as the peer tutors' parents, siblings, and church and school friends. The problems of the handicapped child were new to these people and they have shown great interest in the project children and in sharing their new knowledge with others. The Shorewood High School newspaper

team (two reporters and a photographer) visited the project and wrote a full front page article for their paper. Three additional articles and pictures appeared in the Shoreline District Newspaper, The Everett Herald, and the Shoreline Journal. These articles were much sought after by the peer tutors, who shared numerous Xerox copies with friends and relatives across the country. The program has had a definite "ripple effect," both in the activities of the peer tutors outside the scope of the project, and in the community.

At least five of the peer tutors visited their project students during weekend and vacation periods when the program was not in operation. One tutor worked regularly in a classroom for the deaf-blind students for credit in a high school child development class. Two tutors took their students on shopping trips for clothes. Several tutors donated swimsuits to project children. Tutors began doing "extras" for their students, such as washing their hair while showering after swimming, and taking their swimsuits home to launder them.

Many people from the surrounding community became aware of the project through contact with the peer tutors. News of the project has spread as far as Norway, where one tutor is now an exchange student. She returns in the fall, bringing a Norwegian student with her, and she intends to work as a substitute peer tutor. In addition to peer tutors' parents' visits to the program, one parent attended a peer tutor inservice training session.

Nine of the thirteen peer tutors from the first year's program graduated from high school in June, 1981. Of these, eight made the decision to work in the "helping professions." Four enrolled in the Developmental Disabilities Program at a community college. One began social work training. Another plans to study medicine. Two have started working in homes for the disabled.

Child Gains

The staff attempted to form a control group of several deaf-blind children who were not involved in the water program in order to compare differences in gains between the two groups. However, this was not feasible. Among would-be control children, health problems kept some children out of educational programs for very long periods, one child died, and extreme differences in level of function between this group and the target children were found in baseline data.

Results, therefore, are presently reported for project children only, showing gains as measured with standardized tools (see Figure 3). These standardized tests, although modified to some degree for this population, do not allow for the very small incremental gains observed in this population. Since these severely impaired children would not be expected to gain a full 6 months in 6 months time, as would normal children, the scattered gains show greater sensitivity to small changes. If results are reported at a specific level in months (as we report results for gross motor and communication skills), the gains are extremely small or nonexistent. However, if results are reported in scattered gains (as we report social skills), then gains better reflect subjective reports of child growth made by teachers and hall staff and may provide a more accurate picture of what the severely impaired deaf-blind child has learned. For example, suppose a child is given a pretest in social skills and demonstrates mastery at the 3-month level. Following intervention, the child is retested and some of the new behaviors he exhibits are:

smiles in response to an adult's attempt at intervention

initiates an interaction with an adult

responds to a single command

Because these new behaviors are splinter skills and are found at several different age levels, the child cannot be given any credit for his achievement unless a report of this "scatter" is permitted. For severely impaired deaf-blind children, this appears to be a reasonable approach to reporting gains and may offer insight into future intervention strategies as well.

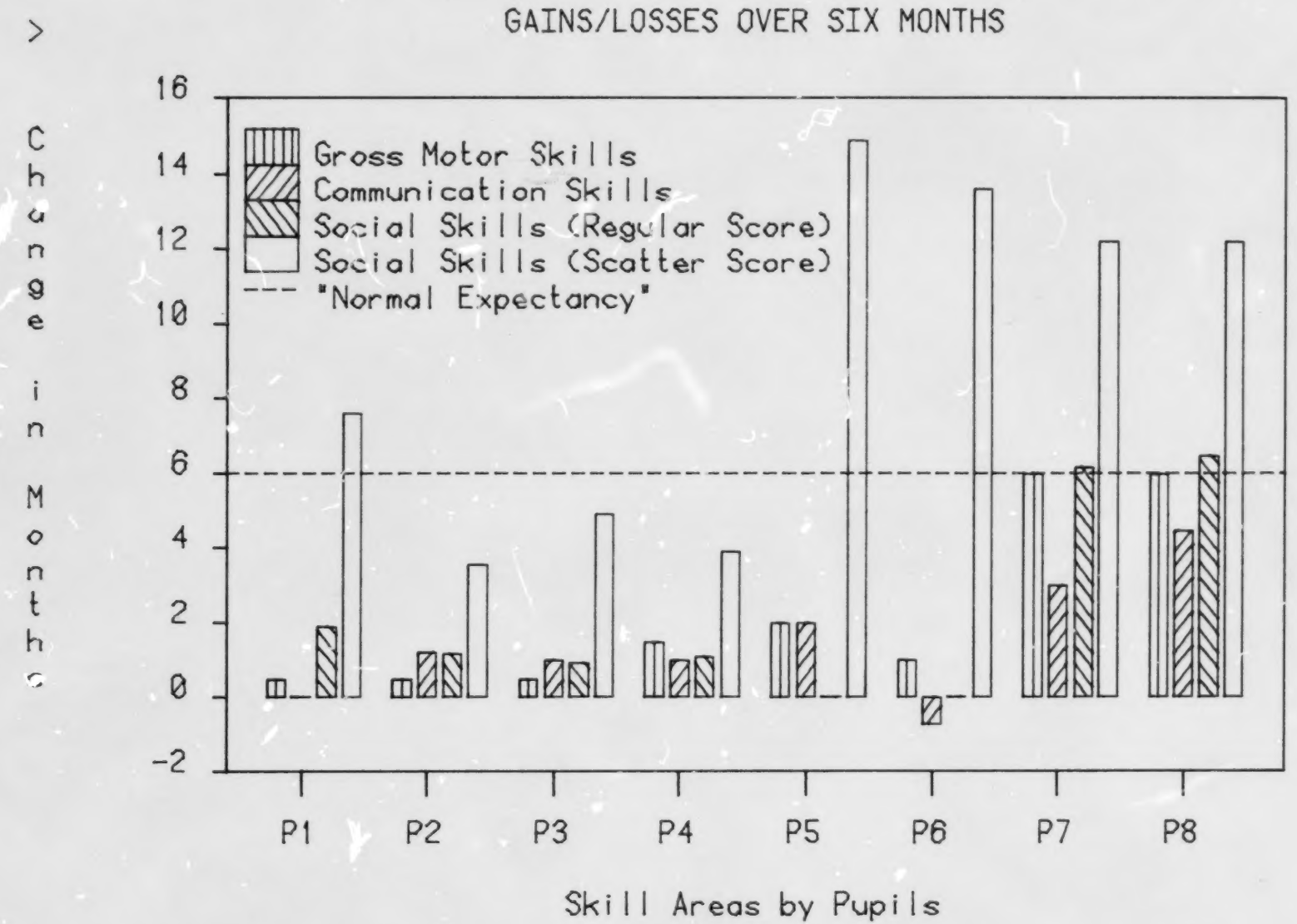
Insert Figure 3 here

The mean gains for subskills for all eight children are shown in Figure 4. By reporting "scattered gains" as well as "gains," the staff can record the actual learning ability of the children, which in some cases is statistically significant.

Insert Figure 4 here

Peer Tutor Data

An attitude survey was given twice to the peer tutors in 6 months; once before they began training and working with the deaf-blind children and once after they had received training and had worked with the deaf-blind children for 3 months. An analysis of variance was utilized to determine significance of changes and to see whether certain peer tutor characteristics affect their attitudes. Two characteristics appeared to significantly affect attitude: last grade in school (.03 level of confidence) and whether or not they have worked with disabled people previously (.01 level of confidence). In other words, the older students who had been exposed to handicapped previously appeared to experience the greatest positive changes in attitude. The survey


GAINS/LOSSES OVER SIX MONTHS
Change in Months
16
14
12
10
8
6
4
2
0
-2
Gross Motor Skills
Communication Skills
Social Skills (Regular Score)
Social Skills (Scatter Score)
"Normal Expectancy"
P1
P2
P3
P4
P5
P6
P7
P8
Skill Areas by Pupils

-17-
Figure 3

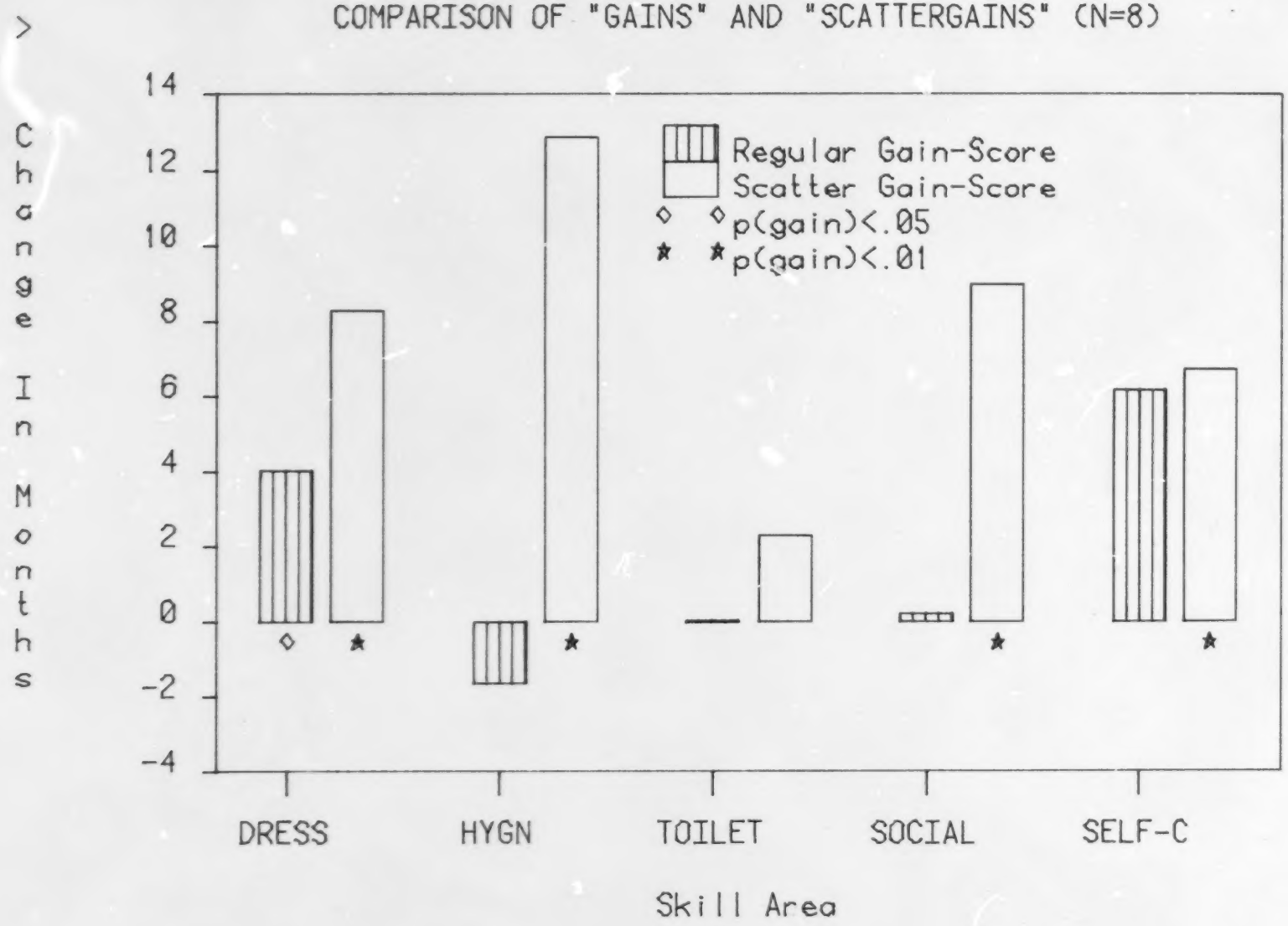

COMPARISON OF "GAINS" AND "SCATTERGAINS" (N=8)
Change In Months
14
12
10
8
6
4
2
0
-2
-4
Regular Gain-Score
Scatter Gain-Score
◇ p(gain)<.05
★ p(gain)<.01
DRESS
HYGN
TOILET
SOCIAL
SELF-C
Skill Area

Figure 4

disclosed attitude changes in many areas, three of which were statistically significant (at levels of confidence of .01 to .07). The changes reflect the peer tutors' increased comfort in working with deaf-blind children who "look funny"; having strong feelings of affection for the deaf-blind children; and being able to do more for the children than just make them comfortable. In other words, the peer tutors no longer felt repulsed by working with strange looking children, really grew to like and care for these children and believed that they could really teach the deaf-blind children new skills. It is also of great interest to note that, at first, in an exercise when they were asked to describe their deaf-blind children, they used terms such as "gross" and "obese" and were shocked and wanted to "run away." After being trained and working with the children, the peer tutors changed and used terms such as "loveable," "willing," "capable of learning," "very bright," etc.

In addition to showing changes in attitude, the peer tutors demonstrated significant gains in their knowledge of deaf-blind children and of the training topics following their initial training. Before training, their pretest mean scores were 28% correct. Following training, their post-test mean scores were 87% correct. As noted earlier, the peer tutors brought 33 family members (parents, siblings) and friends to visit the project during the initial 6 months. These results would suggest that they experienced a very high level of commitment to the program and to the deaf-blind children.

Discussion

When this program was first planned, there were many who regarded it with skepticism. On the face of it, there were reasons to agree with the sense that it might be a difficult program to implement; some of its elements were

possibly too innovative, and the combination of innovations might be unworkable. First, the idea of attempting to teach developmental skills to a severely impaired group through means of a leisure program struck some as misguided. But in view of the project's goal of increasing the children's opportunities for integration with nonhandicapped people, the recreational program seems a more logical choice than a classroom-based program; these low-functioning children could not reasonably be expected to participate in "integrated" classrooms in any sense other than through mere physical proximity to nonhandicapped children. Second, the use of a "swimming" program for this population was considered highly questionable, although people who work with deaf-blind children understand that their severe motor problems are less impairing in the water, where the children are buoyed and more relaxed. It seemed reasonable to test the feasibility of using such a comforting environment as a place for learning. The plan to employ high school students as the children's primary instructors within this relatively untested learning environment also caused some disbelief. Yet the literature on peer- and cross-age tutoring has given ample evidence of the effectiveness of such strategies, and within this project, the use of peer tutors met one of the project's main objectives -- that is, to increase the deaf-blind students' meaningful contacts with nonhandicapped persons. Finally, implementation of this project involves the cooperative efforts of four organizations: a university, a school district, a state agency, and an institution run by the agency. For many people, that appeared to be an invitation to failure and "territorial" problems.

I do not want to convey the idea that the program has been completely easy to implement. There are difficult administrative hurdles that must be dealt with constantly; coordination is an ongoing problem. The target children

often have medical and behavioral problems that interfere with smooth functioning of the instructional program. Data have been difficult to obtain due to illness of the children, pool closures, and site staff turnover. Occasionally the well known problems of working with adolescents emerge in our peer tutor component. Early in the program there were difficulties in attaining full cooperation of the residential hall staff, who made it clear that they felt overworked, and at first resisted any involvement that they believed would increase their workload. However, after we redesigned our approach to the hall staff, they became committed to the goals of the project and now assist the project staff in helping the children generalize newly learned behaviors on the residence halls.

It is especially gratifying to report that the program <u>is</u> working quite smoothly and is characterized by a high degree of cooperation and good will from everyone involved. The water has proved to be a feasible learning environment for the deaf-blind children, and gains have been exciting despite the children's severe health problems. Hall staff report that the children have shown a marked decrease in inappropriate behaviors and appear to be more "content" -- that is, they exhibit more smiles and more appropriate social behaviors. The peer tutors' high level of competence and sense of responsibility towards the children and the program are sources of immense satisfaction to the project staff and to the administrators of the institution in which the project takes place. The training program devised by the project staff has been validated by the tutors' skillful work with the children.

One important implication of this water-based program is that, given its feasibility with a profoundly impaired population, it could be easily used or adapted for work with children who are less severely handicapped than our project children; it would seem especially viable as a model for children who

have motor problems that interfere with their learning "on land." The peer tutor component would also seem to be easily adaptable to other programs serving less severely handicapped children, given adequate training of the tutors.

For those who are interested, additional data will be available at the end of the second year (August, 1982). These data will reflect single subject child gains for 11 deaf-blind children over a 9-month period as well as changes in attitude for two populations who work with the project children.

During the program's third year (beginning in September, 1982), replicability of the project model will be tested when some of the administrative responsibilities will be turned over to the institution where the children reside and the project staff will primarily provide technical assistance to personnel at other facilities using the training modules developed by project staff.

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Note: Slides shown at the CEC convention showing deaf-blind children working on objectives with peer tutors are available at cost. Contact Dr. Thompson, EEU WJ-10, University of Washington, Seattle, WA 98195.